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To meet the increasing demand for educational research specialists, the author proposes a graduate level study plan which school systems can initiate. State school systems would recruit students, provide partial financial support, and assure school employment. Emphasis on a short program with a large number of trainees is necessary. To facilitate experimentation between laboratory and classroom, a liaison research specialist would offer support to interns returning to school systems. The program in educational research at the University of Wisconsin stresses interaction between teacher, liaison personnel, and laboratory personnel. Research design and analysis, research implementation, and related research proposals are the focus of study. (NS)

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Preparing Educational-Research Specialists for School Systems*

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We hear from all sides that educational researchers will be in very short supply for the next decade, at least. Already, spurred on by funds from Title IV of the Elementary and Secondary Education Act of 1965 and other sources, universities across the country are launching huge doctoral programs to produce many educational researchers, prepared quickly and well. You can sense the surge of energy by reading in the June 1966 issue of the Educational Researcher the list of pre- and postdoctoral programs funded initially under Title IV.

Alas, though, there's many a slip twixt the dollar and the degree. Each doctorate-producing institution must have devoted recruiters of talent, nurturers of graduate students, competent professors, and excellent researchers, not to mention administrators such as deans and heads of departments who have great wisdom and almost unlimited patience.

Many such programs will die without viable issue because the one person who had the idea and got the money then moved to another institution.

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I readily found the names of four such individuals in the Educational Researcher listing, and undoubtedly there were more whose announcements of transfer had not yet swung to me via the academic grapevine. We hope that someone else at the defector's university will catch the grants on the rebound and make doctoral runs with them, but not every team has an adequate reserve halfback, much less a brilliant one. Many professors of education simply don't care whether doctoral recipients are produced or whether such recipients are equipped to be educational researchers. Often, they are preoccupied with teacher training instead.

The Cruciality of Recruiting

From the several perspectives I have been fated to have during twenty-one years (which makes me "of age"?) as full-time graduate student and professor, recruiting of able persons to become educational researchers seems the most crucial and neglected of all aspects of the preparation of educational researchers. No programs of courses, research experiences, and internships can produce miracles with students too old, too lacking in research orientation, or too slow to absorb the offerings. On the other hand, if we recruit able, young, research-oriented persons, then poor graduate programs--and inadequate professors as well--will go down under the onslaught of their keen minds and strong motivation, or the students will leave the programs in disgust. The quality of the entering student does more than any other one thing to determine the quality of the researcher produced, because the quality of the experiences graduate students have is highly dependent on the level at which such students can interact with each other and with the more stimulating of their professors. A

program of courses "in a vacuum"--that is, without reference to the characteristics and quality of the inputs--is ridiculous, and yet many faculty hours are spent setting them up, when much of that time could be used more wisely in seeking better beginning students than happen to walk by the professor's door or into his undergraduate classes.

Preparing Specialists in Educational Research for School Systems

For doctoral programs we must hunt able students everywhere, because, unlike Avis, we're not even close to being No. 2 in the talent-getting business. I could write about recruitment of doctoral candidates, with anecdotes and examples, for a long while, but let me instead get directly to the concerns of school systems, rather than moaning about the plight of the universities in luring able, young, research-oriented persons into graduate programs in educational research and keeping them there until they earn excellent doctorates.

The Ph.D. degree in educational research is expensive for student and university alike. It takes much time and effort from both. Thus it does not seem likely to me that we can hope to have well-prepared holders of this degree (or of a research-oriented Ed.D. degree) filling many school-system research positions.

Furthermore, it seems to me that the right kind of input to graduate study could lead to the desirable kind of output to school systems in fifteen months, just two summers and one academic year of schooling. The prospective educational researcher for a school system would begin his technical preparation in June of one year and complete it in August of

the next. He would study full-time and intensively during those fifteen months, of course, but they would cost him and his school system only one academic year.

I propose that school systems of a state work together to seek the fine inputs needed, to help support them for fifteen months, and to assure them of suitable positions at appropriate pay when they complete the program satisfactorily. Thus, in one year from the time the program began operation, the state would have back in its school systems persons ready and able to do applied educational research and to help others do it.

Even allowing for some political problems among school systems, the following scheme or a modification of it should be feasible: Find throughout the state, and perhaps even the nation, teachers who have taught at least two and not more than five years, who are not older than 30 (the younger the better!) at the time the program begins, and who have the interests and other aptitudes for educational research. They should be bright enough, both verbally and quantitatively, to learn much in a short time, but they need not be of doctoral caliber. Their undergraduate grades should have been good, but they need not have been really excellent. They should have some theoretical bent, but this should be tempered with pragmatism and altruism. The fewer dependents they have, the better.

Encourage as many persons as possible who possess these qualifications (spelled out more specifically than I have done) to apply to one or more designated universities for a special fellowship, funded partly by the U. S. Office of Education or other organizations and partly by the school systems. Ideally, the awardee's overall income would be five-thirds

of his teaching salary for the academic year, plus a travel allowance for himself and his dependents if he has to relocate. In return, he would agree to work at least two years as an educational-research specialist in the school system that supplemented the fellowship, at a salary commensurate with his new training and duties.

Each university conducting such a program would choose those applicants it felt were best qualified to benefit from its fifteen-month sequence in educational research for school systems. It would devise appropriate experiences, including internships in nearby school systems, to insure that the participants became prepared to exercise leadership in educational research when they returned to the school system that had helped support them. Because students would be selected carefully for ability and motivation, most who persisted during the fifteen months would complete the program successfully. The two-year commitment to work in a specified school system thereafter would foil the natural tendencies of the university to recruit the best of the participants for further study toward the doctorate immediately, but just to be doubly safe the fellowship agreement should specify that the student must leave the university as a full-time student after the fifteen months for at least a two-year period or repay the full amount of the fellowship. If he argued his way out of the two-year commitment with the school system, he should be required to repay that support, too. We do not want to make an indentured servant of the participant, but at least he must be responsible financially for his failure to return to the school system that gave him the security necessary for the training acquired.

Most participants would earn a Master's degree in educational research during the fifteen months, with a thesis or other research project required. They would have no foreign-language requirements. Some universities might administer comprehensive written or oral examinations near the end of the program.

Presumably, each participant would be on official leave from a teaching position in a specific school system. Perhaps most of them would have been teachers in the same system the previous year, but some might have been hired at the beginning of the program and put on leave status immediately. Obviously, the success of such a scheme depends heavily on the willingness of enough school systems to grant leaves, to supplement fellowships, and to guarantee a higher-level position for at least two years if the participant completes the program successfully.

I can visualize how we might start an all-U.S. program of this sort at the University of Wisconsin, beginning in June of 1968, to accommodate 30-50 persons. Some other universities might be able to tool up fast enough, particularly if operating within just one state, to launch a program in June of 1967.

How to Supplement the Plan

There is an appreciable number of fairly promising prospects in the school-system pool, but most of the really big fish swim elsewhere. We can start with the two-years-or-more teaching requirement, because that will get us down to essentials without too much unproductive argument, but we must stop there. It is essential that we recruit <u>into</u> educational research many persons who would not become regular classroom teachers first.

I believe that we can make a fifteen-month graduate program of a rather different sort work as the entering wedge for able, young, research-oriented graduates of liberal-arts curricula who have had few if any courses in education. This would be somewhat like the familiar Master of Arts in teaching programs of Harvard, Yale, Wisconsin, and many other universities, except that the substantive emphasis would be on human learning and educational research rather than a teaching subject.

There are great advantages to casting our net among liberal-arts students. The prospects can be younger, abler, more research-oriented, and less expensive. Supplementary salaries from school systems, leaves of absence, and virtual guarantee of successful completion of the program would not be essential (though some of these might be quite desirable). One could even have a two-layered approach, with some of the participants becoming educational-research specialists in school systems, research and development centers, and regional laboratories at the end of fifteen months, and others continuing toward the doctorate in educational research immediately. No doubt, though, a good position in a school system after just fifteen months of graduate preparation would be a strong incentive.

I tend to look with disfavor on educational-research specialization for undergraduates, unless fitted smoothly into a five-year plan that results in both a liberal-arts baccalaureate and a Master's degree in educational research. A few courses, notably statistics, elementary measurement, and data analysis, can probably be pursued well by a college sophomore, junior, or senior, but most of educational research itself may seem remote from the current experiences of the undergraduate. (Perhaps it

need not be, if we use his present setting for research in higher education.) Undergraduate work in educational research should be used mainly to show promising students that scholarly and scientific careers can be pursued in the field of education without first becoming an elementary- or secondary-school teacher.

However we prepare educational researchers for school systems, though, university personnel and schoolmen must band together for all-out recruiting and utilization, or else both quantity and quality of educational-research specialists for the future will be too low.

Perhaps I have ascribed too much of a role to universities and too little to state colleges. If state colleges have the necessary staff to conduct adequate Master's-degree-level programs in educational research, they can probably do it more effectively than the large universities that are preoccupied with producing doctorates. Such staff may not be easy to obtain and hold, however. It will seldom be available in education alone, but a coalition of education with other social-science departments such as psychology, sociology, and economics might be successful, if the more knowledgeable researchers in these disciplines can cooperate often enough and long enough.

Fundamental to these plans are good students, a short program, and large numbers of trainees per institution per year--at least 30, and perhaps as many as 100--during the early years. To me it seems <u>essential</u> that only one academic year plus two summers be required. A two-academic-year program would increase expenses sharply and reduce the number of possible participants, as well as removing them from their home bases so

long that they might be reluctant to return there. It would also put a number of the participants within striking distance of the doctorate and thereby engender aspirations that might lose them to all but a few affluent school systems.

I am by no means hostile to the idea of having large numbers of splendid doctoral recipients, for that has been my chief goal in recent years, but the aims of the programs just described would be frankly sub-doctoral. Those participants who "caught fire" academically would return to their school systems for at least two years and then continue with doctoral studies, if they wished. If the school system treated them well enough, many persons would probably be glad to forego doctoral plans. On the other hand, if they were swamped with routine pupil-accounting activities to the detriment of interpreting and facilitating research, you can be sure that many of the abler educational-research specialists in school systems would get back to graduate school as quickly as possible. Thus the procedures would be at least partially self-correcting.

Facilitating Educational Experimentation[1]

If we throw a prospective educational researcher with just 15 months of preparation into a school system on his own, the pressures, duties, and confusions of the isolated situation will usually make it unlikely that he will do much worthwhile educational research or aid others to inquire critically. He needs continuing contact with better-prepared researchers in universities, colleges, research and development centers, and regional laboratories. A systematic plan for insuring long-term interactive support

must be an integral part of the training and post-training phases. Of the many ways to structure this supportive relationship I shall present only one, based on the work of the Laboratory of Experimental Design at the University of Wisconsin, which began in September of 1961 primarily for that purpose. Fundamental to this paradigm is availability of a liaison research specialist or teacher in the school system who has more technical competence than his colleagues and some time free to plan and conduct research. Educational-research specialists produced by the 15-month program would be equipped well for this go-between responsibility.

Laboratory research by professional researchers and classroom research by teachers each has its Achilles heel. Research conducted by university specialists may be rigorous but not generalizable to classroom situations, whereas research conducted by teachers may be highly applicable to local situations but not rigorous enough. As increasingly complex designs become necessary in classroom research, one simply cannot expect many persons in school systems to conduct adequate investigations on their own. They need expert assistance in designing and carrying out each study. Also, they need someone to analyze the data, to help them understand the results, and to plan with them further related research on more basic questions than those that teachers usually ask at first.

This substantial, continual assistance to researching teachers can be augmented somewhat by in-service training concerning principles of design and analysis, but unless the teachers have prolonged research experience antecedently or concurrently such training is likely to prove futile.

In the Laboratory of Experimental Design of the Department of Educational Psychology at the University of Wisconsin, we see the assisting process as consisting of 10 sequential steps, somewhat as follows:

1. Certain teachers, meeting with their local research leader (who may be a teacher, supervisor, or director of research--competence being more important than rank), ask a question important to them, the answer to which would be found by research. For example, some social-studies teachers might want to know which of several different methods of teaching a unit are most effective.

2. The local research leader and the teacher best prepared for research come to our Laboratory by appointment to discuss the question and to work out a design for the study. They meet at least once with two or three members of the Laboratory, perhaps one professor and two graduate students. Then, when the time seems right, they attend a seminar of the Laboratory where for an hour or two a design for their investigation is proposed, and members of the Laboratory--some dozen graduate students and two or more professors--discuss various considerations of design and analysis.

3. Two or three members of the Laboratory then meet again with the research leader and one or two teachers for the purpose of setting forth the specific details of the study. This small-group meeting should enable the liaison persons to tell their teachers at home just what is to be done and what data are to be obtained.

4. The local research leader and teachers conduct their research carefully in accordance with the plan, getting whatever assistance from

us and others they need for this.

5. When the study, or a phase of it, is over, the liaison persons bring to the Laboratory data to be analyzed there in previously planned ways. Analysis is done by Laboratory personnel, rather than by the teachers.

6. The liaison persons meet with several members of the Laboratory, perhaps at a seminar, to discuss findings and implications.

7. The liaison persons meet with their local teachers to discuss the findings. Subsequently, if requested, a member of the Laboratory may meet with the teachers to answer questions that arose during the discussion of results.

8. The teachers ask themselves a number of "why" questions concerning the outcomes of their research. With guidance from the local research leader, these should generate related research proposals more fundamental than the question originally asked. One may thus be able to burrow below the surface to concepts more basic and specific than, for example, comparisons of teaching methods. It seems essential that the research proposals continue to come from the teachers themselves, rather than from the Laboratory, in order that research findings will be applied willingly, quickly, and appropriately in classrooms.

9. Sometime during the conduct of the research certain teachers will probably want to study principles of research design and analysis more systematically and extensively than the local planning sessions will permit. A weekly discussion an hour or so in length can be conducted by the local research leader, perhaps using a curriculum guide such as that

prepared by Schutz, Page, and Stanley[2] for the Educational Media Branch of the United States Office of Education. In this guide we present behavioral objectives for in-service training, pertinent pre-course experiences, minimum prerequisites, scope and sequence of course content, instructional exercises, suggested reading, suggested evaluative procedures, and suggested instructor qualifications. We also offer a short abridgement (42 double-spaced pages) of the Campbell and Stanley chapter[3] and a 35-item multiple-choice test over this material.

10. Finally, we expect that some teachers will become interested in the work of the Laboratory itself. They will be encouraged to participate in its activities to whatever extent they wish. Some may choose to take courses at the University of Wisconsin, including measurement and evaluation and statistics and research methods, perhaps working toward the Master of Science degree in educational psychology. Once in a while we may even recruit a promising candidate for the Ph.D. degree, but in the main our goal is to create competent research leaders in local settings, rather than to lure the ablest teachers into college positions.

The above paradigm seems worth trying systematically in school systems where research is viewed as a continuing search for better understanding of teaching-learning situations, rather than as a one-shot crash program to yield immediately applicable findings (or as a damned nuisance!). Much reinforcement of responses made by the participating teachers will be needed at first so that their enthusiasm will not disappear. It would seem best to start with small studies based upon relatively easily answered questions, so that feedback through a full cycle of Steps 1-9 can be given quickly.

Our efforts thus far lead to interesting and instructive results. We encourage other centers, especially regional educational laboratories, to try the same general plan and share their experiences with us. We have been operating adventitiously, however, with few trained educational-research specialists available in school systems to act as effective links between those systems and our Laboratory of Experimental Design. When many school systems have one or more of the "fifteen-month wonders" each, we can expect our program and others like it to become much more effective.

The initiative for all this rests in school systems. If superintendents, principals, and teachers <u>really</u> want educational research done and understood in their schools, they can start processes such as those outlined in this paper. For too long university professors and graduate students have had to intrude their research efforts forcibly into unwilling school-system atmospheres, with small results. The time for partnership is here. Who in public or private schools will start a movement toward research that will lead to genuine educational improvements, rather than perpetuation of cyclic faddism?

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Footnotes

*Based on a paper read at a Conference on Educational Research at the Local Level, Western Washington State College, Bellingham, 3 August 1966. I thank N. L. Gage for many helpful comments concerning an earlier draft.

[1]This section is based largely on my article entitled "A Paradigm for Classroom Experimentation" that appeared on pages 64-65 of the January 1964 (Vol. 19, No. 1) issue of the American Psychologist. Also see my "Facilitating Classroom Experimentation" on pages 24-26 of the Twentieth Yearbook of the National Council on Measurement in Education, 1963.

[2]Richard E. Schutz, Ellis B. Page, and Julian C. Stanley, "Curriculum Guide for a Course in Educational Media Research." Final Report, NDEA Title VII Project No. B-236, October 1962.

[3]Donald T. Campbell and Julian C. Stanley, "Experimental and Quasi-experimental Designs for Research on Teaching." Chapter 5 (pp. 171-246) in N. L. Gage (Ed.), Handbook of Research on Teaching. Chicago: Rand McNally, 1963. This chapter, somewhat supplemented, was issued by Rand McNally as a monograph entitled Experimental and Quasi-experimental Designs for Research in September of 1966.

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I call your attention to an important, interesting book:

Daniel Lerner (Editor), Cause and Effect. Free Press, 60 Fifth Ave., New York, New York 10011, 1965. Pp. xi+211.

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